

What is claimed is:

1. A cardiac pacemaker, comprising:
 - a plurality of sensing/pacing channels, each such channel comprising an electrode for disposing near a chamber of a heart, a pulse generator for outputting pacing pulses, and a sense amplifier for detecting sense signals;
 - a controller for controlling the operation of the pulse generators in response to sensed events and lapsed time intervals and in accordance with a programmed pacing mode;
- 10 an evoked response sensing channel comprising a sense amplifier for sensing an evoked response generated after a pacing pulse;
 - a switching circuit for switching an input of the evoked potential sensing channel to a selected electrode of the sensing/pacing channels;
 - wherein the controller is programmed to perform a capture verification test at a selected time to test a selected sensing/channel for presence or loss of capture, the capture verification test being performed by sensing whether an evoked response occurs during a capture detection window following the output of a pacing pulse; and,
 - wherein the controller is programmed to determine a pacing threshold of a sensing/pacing channel at a selected time by:
 - a) performing a capture verification test on the channel;
 - b) raising or lowering a pacing pulse energy by a specified amount if capture was present or absent, respectively, during the preceding capture verification test;
 - c) repeating the capture verification test with the raised or lowered pacing pulse energy;
 - 25 d) determining the pacing threshold as the unlowered pacing pulse energy if the pacing pulse energy was lowered at step b and a loss of capture occurred during the repeated capture verification test, or repeating steps steps b through d otherwise.

2. The pacemaker of claim 1 comprising sensing/pacing channels for right and left ventricles, wherein the pacemaker is programmed to pace both ventricles during a normal pacing cycle.
- 5 3. The pacemaker of claim 1 wherein the input of the evoked potential sensing channel is switched to an electrode of a sensing/pacing channel other than the channel being tested during a capture verification test.
- 10 4. The pacemaker of claim 3 wherein the controller is programmed to output a backup pacing pulse through a sensing/pacing channel if loss of capture is detected during a capture verification test.
- 15 5. The pacemaker of claim 4 wherein the controller is programmed such that the backup pacing pulse is output through a sensing/pacing channel other than the channel being tested during the capture verification test.
- 20 6. The pacemaker of claim 1 wherein the controller is programmed to blank the sense amplifier of the evoked response sensing channel during the capture verification test for a specified blanking period following a pacing pulse output by the tested sensing/pacing channel, wherein the blanking period is followed by a capture detection window during which an evoked response may be sensed.
- 25 7. The pacemaker of claim 1 wherein the pacing pulse energy is raised and lowered by adjusting the duration of the pacing pulse.
8. The pacemaker of claim 1 wherein the pacing pulse energy is raised and lowered by adjusting the voltage amplitude of the pacing pulse.

9. The pacemaker of claim 1 wherein the pacemaker is programmed to perform a pacing threshold determination on a selected channel in accordance with commands received via a telemetry link from an external programmer.

5 10. The pacemaker of claim 1 wherein the pacemaker is programmed to perform a pacing threshold determination on a selected channel at periodic intervals.

11. A method for determining a pacing threshold for a pacemaker having a plurality of sensing/pacing channels, comprising:

10 a) performing a capture verification test on a selected pacing channel by switching an input of an evoked response sensing channel to an electrode of a sensing/pacing channel with a switching circuit, outputting a pacing pulse through the selected channel, and sensing whether an evoked response occurs during a capture detection window following the output of the pacing pulse;

15 b) raising or lowering a pacing pulse energy by a specified amount if capture was present or absent, respectively, during the preceding capture verification test;

c) repeating the capture verification test with the raised or lowered pacing pulse energy; and,

20 d) determining the pacing threshold as the unlowered pacing pulse energy if the pacing voltage was lowered at step b and a loss of capture occurred during the repeated capture verification test, or repeating steps b through d otherwise.

12. The method of claim 11 wherein the pacemaker is a biventricular device with at least two ventricular sensing/pacing channels and further comprising selecting one 25 of the ventricular sensing/pacing channels for testing and switching the input of the evoked response sensing channel to an electrode of another ventricular sensing/pacing channel.

13. The method of claim 11 wherein the input of the evoked potential sensing channel is switched to an electrode of a sensing/pacing channel other than the channel being tested during a capture verification test.
- 5 14. The method of claim 13 further comprising outputting a backup pacing pulse through a sensing/pacing channel if loss of capture is detected during a capture verification test.
- 10 15. The method of claim 14 wherein the backup pacing pulse is output through a sensing/pacing channel other than the channel being tested during the capture verification test.
- 15 16. The method of claim 1 further comprising blanking a sense amplifier of the evoked response sensing channel during the capture verification test for a specified blanking period following a pacing pulse output by the tested sensing/pacing channel, wherein the blanking period is followed by a capture detection window during which an evoked response may be sensed.
- 20 17. The method of claim 11 wherein the pacing pulse energy is raised and lowered by adjusting the duration of the pacing pulse.
- 25 18. The method of claim 11 wherein the pacing pulse energy is raised and lowered by adjusting the voltage amplitude of the pacing pulse.
- 30 19. The method of claim 11 further comprising performing a pacing threshold determination on a selected channel at periodic intervals.
20. The method of claim 11 further comprising performing a pacing threshold determination on a selected channel in accordance with commands received via a telemetry link from an external programmer.